WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE
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Washington, D. C. No. 3 April, 1936

Conservation: Cooperative, in Ohio

Anon. Cooperative wildlife conservation, Bureau of Scientific Research (Division of Conservation, Columbus, Ohio), Bul. 90, 1935, 6 pp. Mimeographed.

"Intelligent wildlife conservation is based upon the ecology of plants and animals x x x Biological facts, not mere words, count in constructive conservation movements." The great part farms play in wildlife production in Ohio is emphasized. Overfishing more important than pollution in restricting fisheries. Institutions cooperating in wildlife research are listed, and the results of numerous projects briefly summarized. Some of these relate to the food of hawks and owls, the electric incubation and brooding of ring-neck pheasants, a survey of rabbit parasites, and various game bird studies.

Conservation: Status of hawks

Eaton, Warren F. Some notes on the 1935 season, National Assoc. Audubon Societies Circ. (1775 Broadway, New York, N. Y.) 24, 1936, 16 pp.

Especially devoted to field reports on raptorial birds, giving data on individual observations, "vermin" contests, hawk-shooting stands, and bounty payments. The tide certainly is still running against the hawks and aggressive measures tend to favor the Accipiter group to the detriment of the larger and more beneficial species.

Control: Rabbit damage

Anon. Indirect rabbit control, Forest Research Digest (Lake States Forest Exp. Sta., St. Paul, Minn.), February 1935, p. 7. Mimeographed.

Clearing out underbrush in planted areas greatly reduced injury by rabbits. "It is believed that leaving scattered trees or snags as perches for hawks and owls will prove valuable in keeping down the number of rabbits."

Cycles: Snowshoe hare

MacLulich, D. A. Fluctuations in the number of snowshoe rabbits, Forestry Chronicle (Box 43, Knowlton, Quebec, 50 cents a copy), 11(4), December 1935, pp. 283-286, 1 graph. About the same material also in Fluctuations in numbers of varying hares, Science (Science Press, Lancaster, Pa., 15 cents a copy) 83(2146), Feb. 14, 1936, p. 162.

Notes on progress of cyclic phenomena and on parasites and diseases. However "the cause or causes of the decrease have not been determined."

Disease: Gapes

Campbell, James W. The gapeworm (Syngamus) in wild birds, Journ. An. Ecol. (Cambridge Univ. Press, Fetter Lane, E.C. 4, London, England), 4(2), Nov. 1935, pp. 208-215, 4 tables.

1,011 British birds of 53 species examined; gapeworms (Syngamus merulae) were found in 3 species, and S. trachea, the poultry gapeworm, in 8, of which 4 are species occurring in the United States. These are the magpie, starling, English sparrow, and pheasant. For American records see Bul. 140, U. S. Nat. Mus., 1927, and Tech. Bul. 49, U. S. Dept. Agr., 1928.

Disease: Snowshoe hares, etc.

Green, R. G. and J. E. Shillinger. Minnesota Wildlife Disease Investigation (obtainable from Dr. J. E. Shillinger, Biological Survey, Washington, D. C.), Nov. 1935, pp. 78-86, fig. 7, tables 79-81. Mimeographed.

The occurrence of ticks on snowshoe hares has two peaks in a season, namely, in May-June and September-October. The average maximum infestation per individual hare is something more than 4,000 ticks. The previous snowshoe hare decline in the Lake Alexander, Minn., region seems to have been about 1926 or 1927, and another has been observed in 1934 and 1935. Pathological reports are given on 20 snowshoe hares and 3 other mammals and 7 birds.

Disease: Snowshoe hares, etc.

Green, R. G. and J. E. Shillinger. Minnesota Wildlife Disease Investigation (obtainable from Dr. J. E. Shillinger, Biological Survey, Washington, D. C.), Dec. 1935, pp. 87-99. Mimeographed.

Investigation of 18 ruffed and 1 sharp-tailed grouse collected in Minnesota and Wisconsin during a period of decline in numbers yielded little evidence of disease. A group of 25 snowshoe hares from the same area shows gross pathology of the lungs due in part to lungworms, in part to pulmonary tularemia, and in part to unidentified agents. Pathological reports on miscellaneous specimens, 5 mammals, and 8 birds also are given.

Disease: Tularemia

Halliday, C. H. Tularemia, Maryland Conservationist (512 Munsey Bldg., Baltimore, Md., no price quoted), 13(1), 1936, pp. 1-5, 3 figs., 4 tables.

History of occurrence in man and animals; characteristics of the causative organism, Bacterium tularense; symptoms of five types of the disease in humans; treatment; distribution, geographically and also by sexes and ages; prevention and control; unique features; tick paralysis. One of the tables

and a map showing cases reported in Maryland in the years 1928-1935 - eighty-nine in number. This thorough and comprehensive account of tularemia closes with a bibliography of about 20 titles.

Disease: Tularemia

Anon. Case of "Rabbit fever" acquired from pheasants, Science News Letter (Science Service, 2101 Constitution Ave., Washington, D. C., 15 cents a copy), 29(777), Feb. 29, 1936, p. 136.

Tularemia in Minnesota diagnosed and cured by tularemic goat serum at the Mayo Clinic.

Disease: Ulcerative enteritis

LeDune, Emmett K. Ulcerative enteritis in ruffed grouse, Veterinary Medicine (75 East Wacker Drive, Chicago, Ill., 50 cents a copy), 30(9), pp. 394-395.

On a game farm in Ohio; symptoms, post-mortem appearance, control methods.

Ecology: Animal distribution of acorns

Grinnell, J. Why we need wild birds and mammals, Sci. Monthly (Lancaster, Pa., 50 cents a copy), Dec. 1935, pp. 553-556. About the same material under the title Up-hill Planters was published in The Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif., 50 cents a copy), 38(2), March-April 1936, pp. 80-82.

Dependence of oaks upon birds and squirrels for up-hill distribution of their acorns.

Ecology: CCC work

Rutledge, Archibald. Invading the sanctuaries, Field and Stream (578 Madison Ave., New York, N. Y., 25 cents a copy), 40(11), March 1936, pp. 14-15, 54-55, 2 drawings.

The subtitle query, "Are the so-called conservation activities of the CCC detrimental to game?" is answered in the affirmative. Roads constructed to facilitate fire-fighting also increase fire hazards. They impair the sanctuary value of wild places, bring pollution to previously unpolluted waters, and increase the number of hunters. Constructive suggestions are to develop new water supplies, to aid reforestation, and to plant food-producing shrubs and vines.

Ecology: Climatic conditions in relation to bird introduction

Twomey, Arthur C. Climographic studies of certain introduced and migratory birds, Ecology (Prince & Lemon Sts., Lancaster, Pa., $1.25 a copy), 17(1), Jan. 1936, pp. 122-132, 12 figs. (climographs).

Climographs are polygons embracing points determined by two ordinates, one for temperature and one for rainfall, for each unit period used, months in the present instance. Superposed, those for different localities show the degree of coincidence of the climatic factors used according to seasons. Comparing climographs of the native range and the place of proposed introduction is suggested as a test of probable success, for the conclusion is drawn that introduced "birds will perish unless they obtain an optimum both of temperature and precipitation highly similar to those existing in their native habitat at least during the critical time of nesting." A paper published in 1929 (Game birds suitable for naturalizing in the United States, U. S. Dept. Agr. Circ. 96), but not mentioned by Twomey, anticipated his conclusions at least to the following extent: "In the case of a desirable bird, if the rainfall and temperature of its native home can be fairly well matched, it is safe to assume that other conditions can be so altered and controlled as to make them favorable to its naturalization," and "The birds that man has most successfully exploited have chiefly been wide-ranging forms of evident hardiness, having adaptability to a great diversity of environment and to extremes of climate." The bearing of repeated trials upon success of introduction also is not mentioned. Some species have succeeded in areas that were the site of numerous previous failures.

As to migratory species, it is said that those "with a restricted summer range tend to seek the summer optimum of temperature and rainfall in their winter range." In this case the effects of limited numbers and specific sociability may be contributory. The statement that "Migratory birds with a wide climatic tolerance of both nesting and winter ranges are not strongly affected by the two factors of temperature and rainfall" seems only a truism.

Ecology: Drainage operations

Burlington, H. J. The relation of mosquito control in New Jersey to the presence of game on the salt marshes, Proc. 22nd Ann. Meeting N. J. Mosquito Extermination Assoc. (Secretary, Thomas J. Headlee, Dayton, N. J.), 1935, pp. 141-142.

No harmful effect on upland game visiting salt marshes.

Ecology: Drainage operations

Corkran, W. S. The relation of mosquito control to the muskrat industry on the salt marshes, Proc. 22nd Ann. Meeting N. J. Mosquito Extermination Assoc. (Secretary, Thomas J. Headlee, Dayton, N. J.), 1935, pp. 137-141, 2 tables.

Reports opinions of trappers favorable to mosquito-control ditching, gives results of a brief period of test trapping on areas before and after ditching, and notes on habits and food of muskrats in Sussex County, N. J. The favorite foods are reported to be three-square rushes (Scirpus americanus, S. olneyi, S. robustus), cattails (Typha angustifolia, T. latifolia), and needle-grass (Juncus roemerianus). Recommendations are as follows:

"We believe that the minimum width of ditches on muskrat marshes should be 20 inches, and preferably 30 inches or more. The muskrats block the 10-inch ditches with their debris in one season.

"No ditching should be done during the trapping season, but as soon after it as possible. Muskrat houses should not be disturbed. Ditches on muskrat marshes should be cleaned each spring after the trapping season.

"Flood gates should be installed to control the level of fresh water coming on to the marsh from the upland and from rains. Tide gates are needed to exclude high waters backing up particularly salt water."

Ecology: Drainage operations

Headlee, Thomas J. Summary of symposium on the relation of mosquito control in New Jersey to wildlife on the salt marshes, Proc. 22nd Ann. Meeting N. J. Mosquito Extermination Assoc. (Secretary, Thomas J. Headlee, Dayton, N . J.), 1935, pp. 144-146.

Consists mainly of references to the other papers here abstracted, but brings out the point that pyrethrum larvicides now render unnecessary the use of oil or any material that destroys aquatic vegetation. The desirability of improving mosquito control operations in relation to all valuable interests is emphasized.

Ecology: Drainage operations

Urner, Charles A. Relation of mosquito control in New Jersey to bird life of the salt marshes, Proc. 22nd Ann. Meeting N. J. Mosquito Extermination Assoc. (Secretary, Thomas J. Headlee, Dayton, N. J.), 1935, pp. 130-135.

These remarks apply more to marshes having fresh or brackish ponds which may be more or less dried by ditching and not to practically sea level salt marshes flooded at every tide and not dried by the usual mosquito control operations. The statements as to use of oil should be read in the light of Headlee's remark previously noted.

Urner's conclusions are summarized as follows:

"Types of bird life which need low wet marsh of almost full sea salinity with characteristic vegetation, such as Clapper Rail, would not be driven out by ditching such marsh providing its water level, vegetation and salinity were not changed.

"Types of bird life which need brackish ponds and marshes of fairly

constant water level and not directly connected with the tides, such as Pied-billed Grebe, American Coot, Florida Gallinule, Least Bittern, etc., are seriously affected by ditching and driven out by drying.

"The breeding of other species such as Black Duck, Virginia Rail, Willet and some of the Herons, is more or less seriously hurt by ditching and draining of marshes.

"The drying of salt marshes makes them less suitable for shore birds and the change in vegetation of diked salt marsh will eventually drive out most species characteristic of the locality.

"The use of oil on our salt and brackish marsh ponds has two effects on bird life. It kills vegetation and reduces food supply and shelter about open ponds. On open ponds the oil film is not long maintained for it is often promptly blown ashore by the wind. Constant oil applications on breeding grounds require much tramping about, result sometimes in fires and scare off many birds such as breeding ducks.

"Spring burning of marshes is very damaging to the early nesters such as the Black Duck.

"On migration, the numbers of several important species of shore birds and ducks lingering in New Jersey would be greatly reduced by drying of our salt marshes and ponds.

"Establishment of shallow areas open to brackish water at flood tides, on which vegetation and drainage could be controlled would provide feeding areas for hosts of shore birds and many puddle ducks, such as Black, Mallard, Teal, Widgeon and Pintail.

"The opening of diked marsh to the tides after the first killing frosts would under certain conditions render such areas attractive to late shore birds and early migrating ducks.

"The creation of a large swallow population on our salt marshes by providing proper nesting sites during May and June is a phase of mosquito control worth investigating."

Ecology: Economic biology should be comprehensive

Taylor, Walter P. Significance of the biotic community in ecological studies, Quarterly Review of Biology (Williams and Wilkins Co., Baltimore, Md., $1.50 a copy), 10(3), Sept. 1935, pp. 291-307.

The biotic community rather than the animal community alone, or the plant community alone, is the true unit for ecological investigations, corresponding in its development to a complex organism. Discussion of plant and animal interdependencies and of annual and seasonal variation in make-up of biotic communities. Significance of the biome concept in wildlife regulation and in fact in all enterprises in economic biology. Bibliography of 55 titles.

Ecology: Interrelations of range animals

Taylor, Walter P., Charles T. Vorhies, and P. B. Lister. The relation of jack rabbits to grazing in southern Arizona, Journ. Forestry (Society of American Foresters, 839 Seventeenth St., N. W., Washington, D. C., 65 cents a copy), 33(5), May 1935 (April), pp. 490-498, 6 tables, 1 fig.

Stock are primarily responsible for the disappearance of range grasses but jack rabbits, certain other rodents, and grass-feeding insects are more abundant on grazed than on ungrazed areas. Conservative range management will tend to obviate difficulties with these grass consumers as well as with some of the undesirable weeds. Bibliography of 7 titles.

Ecology: Shelterbelt region

Auctt. Possibilities of shelterbelt planting in the Plains Region (Supt. of Documents, Washington, D. C., 75 cents a copy), 1935 (1936), 201 pp. (9x11-1/2), 103 figs., 28 tables, numerous maps.

Geography, climate, ground-water, agriculture, and economics of the shelterbelt region; survey of past plantings; shelterbelt experiences in other lands; native vegetation of the region and planting recommendations. This excellent monograph by 14 authors is indispensable to anyone dealing with trees and shrubs of the area concerned, a 100-mile-broad zone through eastern North Dakota and South Dakota, central Nebraska, western Kansas, and the Panhandle districts of Oklahoma and Texas.

Food Habits: Deer and rabbit damage

Anon. Size of stock in relation to animal injury, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Feb. 1935, pp. 1-2. Mimeographed.

Both deer and rabbits damage larger sizes of planted trees more than the smaller. Two explanations advanced, greater conspicuousness and larger mineral content.

Food Habits: Deer and rabbit damage

Anon. Rabbit or deer damage?, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Dec. 1935, pp. 10-12, 2 figs. (photos). Multigraphed.

Description of chief types of damage to forest plantations and illustrations of ordinary browsing cuts.

Food Habits: Fish-eating birds

Cottam, Clarence, and F. M. Uhler. The role of fish-eating birds, Progressive Fish Culturist (U. S. Bureau of Fisheries, Washington, D. C.), 14, Jan. 1936, 15 pp. Multigraphed.

General sketch of the economic relations of fish-eating birds, brief accounts of findings as to certain groups, and suggestions as to methods of preventing depredations. The groups treated include pelicans, double-crested cormorant, kingfisher, great blue heron, green heron, black-crowned night heron, yellow-crowned night heron, other herons, bittern, gulls and terns, water ouzel, osprey, and mergansers.

Food Habits: Fox, red

Hamilton, W. J., Jr. Notes on food of red foxes in New York and New England, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 16(1), Feb. 1935, pp. 16-21, 3 tables.

Report on analyses of 206 fall and winter stomachs from New York and New England, and 66 from Vermont, New Hampshire, and Massachusetts; on food remains in about 31 dens and in 106 droppings. In numerical frequency, mice, rabbits, and fruits are the leading items. Remarks upon the food of foxes from letters and publications are quoted. The summer diet is little known.

Food Habits: Foxes, grey and red

Errington, Paul L. Food habits of mid-west foxes, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 16(3), Aug. 1935, pp. 192-200, 1 table

Report on examination of the stomachs of 236 Wisconsin and Iowa red foxes and grey foxes, upon food items from 113 Iowa red fox breeding dens, and 1175 Iowa red fox fecal samples. Leading food items taken by the Wisconsin foxes were meadow mice and cottontail rabbits. There was "conspicuous preponderance of comparatively slow prey in the fox diet; there was hardly any representation of animals that could be considered as swift." Cottontails and mice ranked high in frequency also in the Iowa stomach contents. Small numbers of pheasants, quail, and chickens were taken. In Wisconsin the poultry consumed was largely carrion. Den studies revealed numerous game birds, poultry, and other birds, besides rabbits, with mice less numerously represented. Examination of feces again revealed both rabbits and meadow mice as favorite groups of prey. Defects of various types of evidence as to food habits are discussed, correlation of studies of den debris and feces presented in tabular form. "Fox food habits seem to be dependent largely on availability of prey. Small mammals evidently constitute staple foods during the greater part of the year." "Foxes ordinarily do not kill large prey." Depredations on poultry can largely be prevented by keeping an active dog. "Material depredations of foxes upon quail - at least in winter - may be more properly regarded as a symptom of species vulnerability than a factor significantly influencing population levels."

Food Habits: Grouse damage to trees

Anon. What factors reduce plantation survival?, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), July 1935, pp. 4-5. Multigraphed.

Among losses in Michigan plantations of 4 species of pine, those from grouse damage are small, apparently not to exceed one percent.

Food Habits: Hawks

McAtee, W. L. Food habits of common hawks, U. S. Dept. Agr. Circ. 370 (Supt. of Documents, Washington, D. C., 5 cents a copy), Nov. 1935 (Feb. 1936), 36 pp., 17 figs., 1 table.

General discussion of predation, and of the basis for economic appraisal of the food habits of hawks. Statements of range and characters for recognition of groups and species, and accounts of the food habits and economic status based strictly on the results of stomach analysis of 17 species.

Food Habits: House cat

Errington, Paul L. Notes on food habits of southern Wisconsin house cats, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(1), Feb. 1936, pp. 64-65.

Data from 50 stomachs indicate mice far in the lead numerically in the prey, 46 being counted; rats 7, rabbits 3, shrew 1; pigeon 1, English sparrow 1, other small birds 1; other items of food, grasshoppers, crickets, June beetles, carrion, and garbage.

Food Habits: Limpkin

Cottam, Clarence. Food of the limpkin, Wilson Bul. (Dr. T. C. Stephens, Sioux City, Iowa, 60 cents a copy), 48(1), March 1936, pp. 11-13.

Analysis of the contents of 30 stomachs confirms published records that the bird feeds almost exclusively upon mollusk flesh. Identified were snails of the genera Ampullaria and Campeloma and mussels of the genus Lampsilis.

Food Habits: Linnet not a weed seed distributor

Roessler, Elizabeth S. Viability of weed seeds after ingestion by California linnets, The Condor (2068 Escarpa Drive, Eagle Rock, Calif., 50 cents a copy), 38(2), March-April 1936, pp. 62-65, 3 tables.

Of 40,025 seeds eaten by captive birds, only 7 passed and germinated. "Linnets do not spread weed seeds to any appreciable extent, if at all. On the contrary, each linnet probably destroys about 1000 seeds daily."

Food Habits: Rodent damage in forests

Anon. Investigation of rodent damage, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), March 1935, p. 6. Mimeographed.

Slash on ground following logging apparently favored increase in mouse population. The following year despite a good pine seed crop no reproduction was noted. Severe damage in arboretum plantings traced to harvest mice. Research by T. D. Burleigh of the Biological Survey at the Appalachian Forest Experiment Station.

Food Habits: Rodent gnawing marks

Anon. Bark injury by feeding rodents, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Jan.-Feb. 1936, pp. 8-9, 3 figs. Multigraphed.

Describes gnawing by porcupines, red and gray squirrels, snowshoe hares, and mice and gives measurements and illustrations of the tooth cuts of porcupine, red squirrel, and the hare.

Food Habits: Rodents vs. rusts

Meilke, J. L. Rodents as a factor in reducing aecial sporulation of Cronartium ribicola, Journ. Forestry (Society of American Foresters, 839 Seventeenth St., N. W., Washington, D. C., 65 cents a copy), 33(12), Dec. 1935, pp. 994-1003, 1 fig., 1 table.

This fungus, cause of the white-pine blister rust, is eaten by various rodents. "The removal of the infected bark in some instances results in a considerable reduction in volume of aeciospores, the spore stage which infects currants and gooseberries (alternate host plants of the rust)." The paper contains a review of the literature (bibliography of 27 titles given) of rodents feeding on the white-pine blister rust, and also on miscellaneous rusts, and other fungi.

Food Habits: Seal, fur

Schultz, Leonard P., and A. Morris Rafn. Stomach contents of fur seals taken off the coast of Washington, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(1), Feb. 1936, pp. 13-15, 1 table.

Of 28 stomachs containing food, 21 yielded remains of squids, 1 of shrimps, 15 of herrings, and 1 of lamprey. Nearly all held parasitic roundworms, the maximum number being 122.

Food Habits: Seal, harbor

Griffin, Donald R. Stomach contents of Atlantic harbor seals, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(1), Feb. 1936, pp. 65-66.

Notes on 4 Massachusetts specimens; food contents entirely fish; alewives and menhaden identified.

Food Habits: Snowshoe hare

Anon. The seasonal food habits of the snowshoe hare, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), May 1935, p. 7. Mimeographed.

Brief report on analyses by Biological Survey of 53 stomachs collected in Minnesota. In spring the diet is a mixture of woody plants and herbs, the former predominating; in summer herbaceous plants and in fall grasses are the chief food; in winter bark becomes the main reliance.

Food Habits: Snowshoe hare

Anon. Woody food preferences of the snowshoe rabbit in the Lake States, Technical Notes (Lake States Forest Expt. Sta., St. Paul, Minn.) 109, Jan. 1936, 1 p. Multilithed.

Among deciduous species, aspen, willows, and birches are preferred but hazel, alder, dogwood, red oak, silver maple, wild rose, cherry, raspberry, and sumac are readily eaten. In the coniferous group jack pine, white pine, and tamarack are preferred, but Norway pine, white spruce, Scotch pine, and white cedar are eaten and even damaged when other food is scarce. The critical period for damage in coniferous plantations includes the fall and winter month

Food Habits: Striped skunk vs. bees

Storer, Tracy I., and Geo. H. Vansell. Bee-eating proclivities of the striped skunk, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 16(2), May 1935, pp. 118-121, 1 fig.

Depredations on apiaries; fencing suggested to exclude the animals, generally of value as to food habits and also for their fur.

Life Histories: California quail

Sumner, E. Lowell, Jr. A life history study of the California quail, with recommendations for its conservation and management, Part II, Calif. Fish and Game (Fish and Game Commission, 450 McAllister St., San Francisco, Calif.), 21(4), Oct. 1935, pp. 275-342, 59 figs.

This concluding part deals with conservation and management. The chief causes of quail decrease are overhunting, destruction of food and cover by clean farming, overgrazing, and fire control, and exclusive use by man of water sources. Recommendations for overcoming influences inimical to quail are discussed under the headings of cover, food, and water requirements and how these essentials may best be maintained and improved. The natural enemies are rather fully treated and emphasis put on the value of cover improvement over vermin control. Hawks of the genus Accipiter are the most destructive predators. Notes are given on the selection of quail refuges, on the annual shootable increase, methods of restocking, methods of trapping, inbreeding, emergency feeding, economic relations. There is an extensive bibliography. Thirty of the illustrations were prepared to facilitate recognition of plants important to the quail. The work has been well done and it provides a foundation for quail management in California comparable to that available in southeastern states as a result of the Cooperative Quail Investigation of 1924-29.

Life Histories: Crested myna

Scheffer, Theo. H., and Clarence Cottam. The crested myna or Chinese starling, in the Pacific Northwest, U. S. Dept. Agr. Tech. Bul. 467 (Supt. of Documents, Washington, D. C., 5 cents a copy), April 1935 (May), 26 pp., 3 pls. 2 figs., 3 tables.

This introduced species occurs in British Columbia, has been observed in Washington and Oregon but has not yet become established. The appearance and habits of the bird are discussed, the food habits in detail. The myna is aggressive and omnivorous and it is recommended that every precaution be taken to prevent its establishment in the United States.

Life Histories: Deer, white-tailed

Anon. Winter habits of deer, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), July 1935, p. 6. Multigraphed.

A few days' observation on Superior National Forest showed that the animals did not travel far, bedded frequently, and fed chiefly on hazel.

Life Histories: Partridge population factors

Middleton, A. D. Factors controlling the population of the partridge (Perdix perdix) in Great Britain, Proc. Zool. Soc. London 1935(4), Jan. 1936, pp. 795-815; 2 pls., 7 tables. (Reprints probably obtainable from Imperial Chemical Industries Ltd., Millbank, London, S. W. 1, England.)

Report on investigations carried on since 1933 on keepered estates where the Euston system or similar aids but not artificial propagation were employed. Nest and egg mortality is discussed and tabulated. The most important agents of destruction are foxes, farm practices, and rooks. Suggestions are given for recognizing the work of various animal enemies. The average percentage of nests destroyed by all causes is 22. The hatching ratio is almost uniformly high and averages 93 percent. Chick mortality is important but difficult to study. A satisfactory census method is described, however, for birds old enough to be flushed in coveys. Survival varies greatly from year to year but the average young per covey in 25 years on a single estate was 8.4. The percentage of the total stock on this same estate shot in 11 years was 55. The equation of partridge survival must take into account these successive losses: nests, 22%; eggs (failing to hatch), 7%; chicks, 52%; birds shot, 55%; and winter wastage, 40%.

Life Histories: Rabbit, marsh

Tompkins, Ivan R. The marsh rabbit: an incomplete life history, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 16(3), Aug. 1935, pp. 201-205, Pl. 5.

Time of activity, diseases and enemies, tracks, digging, swimming, breeding nest, and young, and economic status. Observations near Savannah, Georgia.

Life Histories: Ring-neck pheasant

McCormick, Robert. Ring-neck pheasant - general habits, Bureau of Scientific Research (Division of Conservation, Columbus, Ohio) Bul. 92, 1935, 3 pp. Mimeographed.

Characteristic range in Ohio for the four seasons; method of spread; size of winter flocks. Pheasants were found in groups up to 362 in number and flocked from December to March. Hungarian partridges were in coveys usually of 16 to 18 birds from September to January.

Life Histories: Small mammals

Townsend, M. T. Studies on some of the small mammals of central New York, Roosevelt Wild Life Annals (Roosevelt Wild Life Forest Expt. Sta., Syracuse, N. Y.), 4(1) [Bul. N. Y. State Coll. Forestry 8(2)], Dec. 1935, 120 pp., 22 figs., 35 tables.

Interesting data on life histories of 3 species of shrews and 6 of mice, gathered in the course of comprehensive trapping operations from which are deduced general conclusions about bait, place, and habitat perception, sex ratios, wandering tendencies, habitat selection, and community relationships. Perhaps of most immediate interest to wildlife managers are figures on population per acre, running over 100 in various habitats. Since birds average only about 2 or 3 to the acre, the suggestion to the abstracter is strong that small mammals may have a much greater economic significance than birds, a matter that to date has received very little attention.

Life Histories: Weight of white-tailed deer

Schoonmaker, W. J. Size and weight of Adirondack deer, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 17(1), Feb. 1936, pp. 67-68.

Believes the white-tailed deer are as large now as in earlier days. Usual weight of 4-point bucks 160 to 170 pounds; maximum for older bucks 400; usual weight of adult does, 130 to 160 pounds.

Management: Age determination of deer

McLean, Donald. The replacement of teeth in deer as a means of age determination, Calif. Fish & Game (450 McAllister St., San Francisco, Calif., 25 cents a copy), 22(1), Jan. 1936, pp. 43-44, 8 figs.

Replacement of teeth in deer of the genus Odocoileus as a means of definitely determining their age.

Management: Bears on Admiralty Island

Heintzleman, B. F., and H. W. Terhune. A plan for the management of brown bear in relation to other resources on Admiralty Island, Alaska, U. S. Dept. Agr. Misc. Publ. 195 (Supt. of Documents, Washington, D. C., 5 cents a copy), 1934 (January 1935), 20 pp., 3 figs.

A cooperative management plan between the Alaska Game Commission and the Forest Service. The publication includes description of the island, its vegetative cover, forest management, and industries; also relationships and life histories of the bears, estimates of their populations, hunting practices, legal protection, and management.

Management: Cooperative agreement, Forest Service and Biological Survey

[Darling, J. N. and F. A. Silcox.] Agreement between Forest Service and Biological Survey, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), March 1935, pp. 7-8. Mimeographed.

As to forest management and wildlife management on lands controlled by the two Bureaus.

Management: Cover on the farm

Anon. Quail, rabbits, and winter feeding, Outdoor Indiana (State House, Indianapolis, Ind., no price quoted), 3(2), March 1936, p. 12.

Value of asparagus, roses, and blackberries for cover; notes on management.

Management: Deer counting

Anon. Morning versus evening deer counts, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Jan. 1935, p. 8. Mimeographed.

On 19.2 mile trips during first two hours and last two hours of daylight, twice as many deer were seen in the morning, possibly because of less interference by other observers.

Management: Farm practice in relation to game birds

Anon. Cooperation of landowners necessary to have good Hungarian partridge and ring-neck pheasant hunting in Ohio, Bureau of Scientific Research (Division of Conservation, Columbus, Ohio) Bul. 86, July 1935, 4 pp. Mimeographed.

Half of the losses of nests of Hungarian partridges are caused by farming operations. The circular quotes Yeatter's suggestions as to modification of farm practice. Observations on the fate of Ohio pheasants on the farm and suggestions for improving the admittedly discouraging situation.

Management: Farm practice in relation to game birds

Anon. Wildlife conservation for the "Future Farmers" of Ohio, Bureau of Scientific Research (Division of Conservation, Columbus, Ohio) Bul. 89, 1935, 4 pp. Mimeographed.

Conservation defined as "the intelligent use of our natural resources" "Game should be a secondary farm crop." The necessity of improving cover and food; effects of farm operations on game birds; and suggestions for conserving farm game.

Management: Farmer-sportsman relationships

Anon. The value of shooting rights to the farmers (Imperial Chemical Industries Ltd., Millbank, London, S.W. 1, England), 7 pp., 7 figs.

In Great Britain, it is stated, from 12 to 75 cents per acre can be realized for shooting rights. Suggestions are given as to management with special reference to the grey or Hungarian partridge. Excerpts: "there ought to be a harvest of game with as much justification as a harvest of crops." "The interests of game are x x x akin to the interests of good farming." "The partridge is undoubtedly the bird of first importance to the farmer."

Management: Feeding upland game

Conklin, W. Gard, and James N. Morton. More food for upland game, Board of Game Commrs. (Harrisburg, Pa.) Bul. 11 rev., 37 pp., 16 photos, 14 other figs., 1935.

Trees and shrubs valuable in feeding game; planting of feed patches; construction and maintenance of feeding stations; special suggestions for winter aid for about 10 species of wildlife.

Management: Food and cover plants for waterfowl

Generosoff, V. T. The culture of food and cover plants for waterfowl (All-Union Cooperative Associated Publishing Office, Leningrad, U.S.S.R.), 1934, 128 pp., 48 figs., 17 tables.

This publication is entirely in Russian; the following much condensed abstracts of the chapters and the accompanying comments were prepared on the basis of a translation by V. Rimsky-Korsakoff employed for the purpose by the Division of Migratory Waterfowl of the Biological Survey:

CHAPTER I, pp. 7-27, treats of general conditions affecting the development of aquatic vegetation. References are given to several Russian works on limnology, of which "Life in Fresh Waters", by A. N. Lipin, State Publication Office, 1926, is especially recommended for game managers. Most of the chapter is taken up by an ecological discussion in which the distribution, and particularly the zonation, of marsh and aquatic plants in response

to environmental factors, are outlined. The deepest zone contains such genera as Chara, Ceratophyllum, and Fontinalis, permanently submerged plants. The next group, plants that live under water but project their flowers above it for pollination, is exemplified by Potamogeton and Elodea. Of a third group, floating-leaved plants, Nymphaea, Nuphar, and Lemna, are cited. A fourth or emersed association includes Scirpus, Phragmites, Equisetum, Typha, Sagittaria, and Polygonum amphibium.

Comments.--The genera, and in great part the species also, are the same for Russia as for America. The object of this chapter is to inform the game manager as to the effects of heat, light, water, and soil on aquatic plant distribution and development, especially in relation to transplanting and acclimatization for the use of waterfowl. In effect the chapter is a brief outline of aquatic plant ecology.

CHAPTER II, pp. 28-52, is devoted to exposition of a method of appraising the productive capacity of waterfowl areas. The author points out the desirability of making surveys before alterations in food or cover conditions are planned. If a large-scale map is available so much the better, if not, one should be made by the simplest means. On this chart should be indicated the shore line and the boundary between the littoral and pelagic aquatic plant zones, and by symbols the distribution of important vegetation in the delimited areas. The necessary traverses can be made by boat, kept on lines by compass steering and using any available landmarks as points of departure. Distances can be roughly estimated by a sort of "pacing", so many short, rather rapid strokes of the oars to a hundred meters. Stakes and buoys can be used for more accurate surveys. A few typical profiles also should be run from points on the shore as far back as nesting cover occurs down through the submerged plant zones.

The composition of the vegetation of any given section of the area surveyed is estimated on a decimal basis. Thus a marsh might be composed of Phragmites 4 parts, Scirpus 3, Typha 1, and Carex 2. Water plants are similarly estimated, as for example Potamogeton 5, Sagittaria 3, and Nymphaea 2. The estimating can be done from a boat moving at moderate speed (5 to 6 kilometers per hour). Knowing the areas involved and the percentage composition of their vegetation, it is easy to compute the approximate acreage stands of any plant species or group of species. To obtain quantitative data, actual counts are made of plants on meter quadrats in growths of medium density.

Although some appraisal of animal food resources would be very desirable, it is impracticable for rapid surveys and is taken into consideration only as casually noted by the individual observers. Final appraisals of areas were based on grades summed up from 5, 3, and 1 point awards made on the basis of relative adequacy of (1) food supply, (2) ordinary cover, (3) nesting cover, and (4) refuge capacity (that is, freedom from harmful or disturbing factors). These four indices of the value of an area for game management were based not only on the presence, quality, and distribution of vegetation, but also upon the entire complex of natural and economic factors noted by the observers. As

these may vary with the season, surveys at different times of year may be required.

Comments.--The object of the appraisal surveys is to enable the preparation of inventory maps showing the principal features affecting ducks, the location of duck-producing areas, the waste spaces, and the tracts having potentialities for improvement. Such maps not only show the game manager what areas may be improved and how much they stand in need of amelioration, but also, from the data given, as to the more satisfactory tracts, indicate the prospects for success in improvement and suggest leads of action in the way of imitating natural conditions on the better parts of the environment.

CHAPTER III, pp. 53-68, deals principally with food plants of waterfowl and tabulates previously published results on analyses of the stomach contents of 347 Russian and more than 8,000 American wild ducks. Results from the latter material are available in the United States in reports by McAtee, Mabbott, and Kubichek. The Russian data are quoted from Tichvinsky, who found the principal seeds eaten to be those of Sparganium, Potamogeton, Scirpus, Carex, Rumex, Nymphaea, and Polygonum, and the vegetation to be chiefly the tubers of Sagittaria and the entire plants of duckweeds.

Generosoff points out the bearing of the results of stomach analyses upon consideration of plants to be used in environmental improvement, but indicates that in Russia emphasis will be placed upon the encouragement of native rather than on the introduction of exotic species. The suggestion of Professor Mal'tsev is mentioned that the ancestral forms of some cultivated plants, because of their adaptability to unfavorable conditions and their power of self-sowing, may be especially valuable for establishment of the desired perennial cultures for feeding wildlife. The objection is realized that cultivation of weedy species may not be desirable in proximity to farm crops and should not be attempted except with the consent of all concerned. Wild forms of buckwheat, hemp, oats, millet, sunflower, quinoa, soybean, and lupine are possibilities mentioned. Experiments with plot cultures are suggested to test the value of various foods and to learn under what conditions they will be most fully utilized by waterfowl.

Comments.--Corrections may here be suggested for some of the author's remarks on the American duck-food studies. The percentages given are not of weight but of volume. Generosoff thinks that animal food because of its less resistant nature is generally underestimated. This is questionable, however, as foliage is no more resistant than flesh, and mollusk shells are more enduring than seeds. The author thinks that hard seeds, as those of Sparganium, should be classed as a mechanical element of the food and that they are erroneously considered by American investigators as being a type of food that is assimilated. Such seeds are regularly ground up, however, and equally hard fructifications of cypress and hickory trees are an important element of the subsistence of wild ducks in southern wooded swamps. "The analysis of the stomachs of American ducks revealed very few grains of cultivated cereals; however, this gives no cause for the assertion that these foods are of no

importance (either actual or potential) in the food of water game. In many places the ducks cause considerable damage to grain crops, and especially in the steppe region in Siberia." Surely no American investigator has wittingly made such a statement regarding grain feeding, for similar cases of damage are well known in this country.

CHAPTER IV, pp. 69-97, is entitled "Propagation of food and cover plants". While admitting that nearly all of the basic data on food plants for wildfowl and publications on their propagation are American, the author thinks the problem has been treated in a one-sided manner. Neglect of cover plants is one reason for this charge, and overemphasis upon the planting of wildrice, another.

Comments.--As to the former, it may be replied that the neglect has not been total, and the need for information on cover plants has not been great. As to the latter allegation, there must be a misunderstanding, for wildrice is allotted only 6 pages out of a total of 66 in Biological Survey publications on propagation of wild duck foods, and the local and seasonal importance of the plant is well understood. In view of his critical remark, it is interesting to note that Generosoff devotes to wildrice 12 pages out of a total of 29 in his chapter on propagation. This chapter is based almost entirely on official documents and dealers' catalogs published in the United States and Canada and contains very little information on Russian plants or conditions.

GENERAL CONCLUSIONS, p. 98, in brief are:

1. The propagation of food and cover plants for waterfowl is an urgent problem in game management in the USSR.

2. If actually put into effect, it will (a) increase the productivity of duck areas and make possible the utilization of lands now barren, thereby increasing game; (b) it will not require large expenditures; nor (c) a highly paid staff, since it can be carried on by local groups of hunters under supervision of game specialists and botanists.

3. The propagation of food plants for waterfowl on a large scale is an important problem in game management and must therefore be carried out according to a definite plan, including (a) reconnaisance surveys of the wildfowl areas of the USSR in order to locate the most important places, (b) carrying out detailed surveys of these areas, (c) collecting duck stomachs on a large scale for scientific food-habit studies, and (d) organizing research work on production areas looking primarily toward the propagation of local food and cover plants and secondarily to the acclimatization of plants from other countries and from other regions of the USSR.

Management: Land economic inventory in Wisconsin

Bordner, John S., et al. Land economic inventory of the State of Wisconsin (Division of Land Economic Inventory, Capitol Bldg., Madison, Wis.), No. 2, Rusk County, 1935, 52 pp., 12 tables, 11 maps, 11 figs. Separate brochure of 26 township cover maps.

The economic inventories of Wisconsin will serve as a partial basis for any wildlife management that may be attempted. Of special interest in this number are pp. 35-47 reporting on a survey of aquatic plants in relation to wildlife.

Management: Land planning for wildlife

National Resources Board. Planning for wildlife in the United States, Supplementary report of the Land Planning Committee, Pt. IX (Supt. of Documents, Washington, D. C., 10 cents a copy), 1935, pp. v+24 (quarto), 9 tables, 2 figs.

An important report on federal participation in land planning for wildlife, past, present, and projected. A detailed abstract would require too much space but the section and subsection headings cited here will give a good idea of the contents of the report. Section I, Requirements for wildlife areas: Economic importance of wildlife, Social and recreational importance, Need of wildlife management, Possibilities and limitations in associating wildlife with other uses of land, Public areas employed as specialized refuges, Public areas designated as refuges but devoted to other major uses, Public areas needed for specialized refuges, Public areas in other uses that should be designated as wildlife refuges, Private lands employed as a habitat for wildlife. Section II, Policies with respect to wildlife: Areas now in public ownership devoted to wildlife, Programs of acquisition; suggestions for modification, Integration of Federal and State policies, Encouraging game production on private lands. Section III, Wildlife management in national forests: Encouraging game management on public land in other use, Economic and social values of wildlife areas, Wildlife and other land uses, Areas suitable only for refuges, Areas specially adapted to wildlife, Areas available for wildlife, Needed additions to forests, Privately owned land as a habitat for wildlife.

Management: Land planning in Illinois

Frison, T. H. Utilization of Illinois lands for forestry, wild life, and recreation, Trans. Ill. State Acad. Sci. (State Natural History Survey, Urbana, Ill., no charge), 27(1), Sept. 1934 (1935), pp. 33-38.

Effects of settlement on natural conditions; value of fish and game; license fees in 1932 indicated one angler to each acre of water, and one hunter to each 118 acres of land; necessity of conservation and planning forestry, wildlife, and recreation, under the guidance of scientifically acquired data of an impartial character.

Management: Niobrara wildlife refuge

Arnundson, Geno A. Facts about Niobrara big game reserve, Outdoor Nebraska (State Game, Forestation, and Parks Comm., Lincoln, Nebr., no price quoted), 11(1), Feb. 15, 1936, pp. 4, 12.

History, description, and brief account of the plants and animals of this federal wildlife preserve.

Management: Opening woodland

Bump, Gardiner. Wanted, more desirable woodlands, Outdoor America (1167 Merchandise Mart, Chicago, Ill., 10 cents a copy), N. S. 1(2), Dec. 1935, pp. 4-5, 11, 3 photos.

The value of openings and forest margins stressed. Seven times as much game found in natural mixed cover as in areas reforested with conifers. Results of experimental slashings given.

Management: Pennsylvania experience

Biddle, Nicholas. Wildlife management by state agencies, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 5 cents a copy), 6(12), March 1936, pp. 3, 20.

Brief statement of revenues and expenditures of Pennsylvania game and fish departments. There are 192 game refuges totalling 132,804 acres on available state hunting lands embracing 2,750,000 acres (ratio about 1:20). Failure to keep deer herd under reasonable control has impaired the environment for these animals and also for grouse, snowshoe rabbits, and other terrestrial forest species. Plans for remedial treatment. Plantations on occupied deer range promptly devoured. On farmer-sport relationships it is noted that efforts to get flushing bars used have met with little success, no feasible way has been found to secure alteration of farm practice in the interest of wildlife, and few sportsmen favor paying for hunting privileges.

Management: Planting

Aldous, C. M. Game food planting, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Sept. 1935, pp. 8-9. Multigraphed.

Successful sowing of wildrice and experimental planting of clovers in Chippewa National Forest, Minnesota.

Management: Planting

Anon. Storage of seed after acid treatments, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Jan.-Feb. 1936, pp. 10-12. Multigraphed.

On storage after treatment with acid to overcome seed dormancy. Honeylocust, sumac, and soapberry can be stored dry at 51° F. for five months; Kentucky coffeetree seeds showed a gradual decrease in germination during storage after treatment.

Management: Planting

Shirley, Hardy L. Seed extraction, storage, and testing in Central Europe (Lake States Forest Expt. Sta., St. Paul, Minn.), March 1936, 2 pp. Multilithed.

Relates mostly to seeds of conifers.

Management: Planting. Black locust seed gathering

Kellogg, Leonard F. Collection, extraction, and yield of black locust seed, Central States Forest Expt. Sta. (Columbus, Ohio), Station Notes No. 28, Feb. 1936, 5 pp., 1 table. Mimeographed.

Suggests collecting from trees with desirable characteristics; notes on methods and feasible rates of picking; threshing; and yield of pods and seeds. In Ohio the yield of seeds is about a fourth of the weight of the pods.

Management: Planting. Black locust seed threshing

Myer, Ben F. A home-made thresher for black locust seed pods, Central States Forest Expt. Sta. (Columbus, Ohio), Station Notes No. 27, Feb. 1936, 3 pp., 1 fig. Mimeographed.

Description and illustration of apparatus for threshing black locust pods in small lots.

Management: Planting. Seed scarifier

Anon. The Denbigh seed scarifier, Forest Research Digest (Lake States Forest Expt. Sta., St. Paul, Minn.), Dec. 1935, pp. 4-5, 1 fig. Multigraphed.

Plans, specifications, and description of a scarifier for seeds having exceptionally heavy seed coats. A leaflet, Technical Notes No. 106, Jan. 1936, 1 p., Abrasives used in scarifying forest tree seeds, issued by the same Station, supplements the article abstracted, by discussing 5 kinds of abrasives, and the results obtained.

Management: Propagation of game food plants

Robbins, P. W. Propagation of trees and shrubs for game food, Agr. Expt. Sta. Quarterly Bul. (State College, East Lansing, Mich.), 18(1), Aug. 1936, pp. 35-37, 2 tables.

Red-osier dogwood (Cornus stolonifera) cuttings survived to a satisfactory degree both when planted unrooted in nature, and in a solar frame. Serviceberry (Amelanchier canadensis) also was successful in the latter test but not in the former, while basswood (Tilia americana) survived neither. The red-osier is thus suitable for economical increase of browse and fruit for wildlife.

Management: Wildfowl sanctuary

Robl, Frank W. My game refuge, Outdoor America (1167 Merchandise Mart, Chicago, Ill., 10 cents a copy), N.S. 1(2), Dec. 1935, pp. 8-9, 4 photos.

A tract of 16-1/2 acres enclosed with a 6 foot fence of one-inch mesh at bottom. Two acres water supplied by a windmill from a well drilled for the purpose. Land area planted to wheat, alfalfa, and a few trees and shrubs, near Ellinwood, Kansas; quite successful.

Management: Woodlot refuges

Steen, Edwin B. The farm woodlot as a bird refuge, Outdoor Indiana (Dept. of Conservation, State House, Indianapolis, Ind., no price quoted), 3(2), March 1936, pp. 2, 25, 1 photo.

General remarks on value of birds, protection from enemies, provision of nest boxes, supplementary feeding, and woodlot practices.

Propagation: Ring-necked pheasant

Anon. Instructions for hatching, feeding and the care of pheasants, Bureau of Scientific Research (Division of Conservation, Columbus, Ohio), Bul. 55, 1935, 4 pp. Mimeographed.

Concise directions as to care of adult pheasants and of the brooding hen, nest and eggs, nest box, and rearing coop, and as to feeding chicks, both by dry and moist mashes, home made and commercial.

Propagation: White-tailed deer

Gerstell, Richard. Breeding experiments with the whitetail deer, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 5 cents a copy), 6(12), March 1936, pp. 4, 20, 2 photos.

Tests continued three years in a 23-acre enclosure where the animals had natural browse and supplementary feed showed that one whitetail buck can successfully mate with seventeen does. About a fourth of the does bore twins. In sire-daughter matings no ill effects of inbreeding were noted.

Research: In Wisconsin

Leopold, Aldo. Wild life research in Wisconsin, Trans. Wis. Acad. Sci. Arts & Letters (Separates obtainable from the author, University of Wisconsin, Madison), 29, 1935, pp. 203-208.

Brief historical sketch of ornithological and other wildlife investigations in Wisconsin; work of Stoddard, Errington, and others in the State; research and its application; bibliography of 14 titles.

WILDLIFE RESEARCH AND MANAGEMENT LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Biological Survey, U. S. Department of Agriculture, Washington, D. C.

BS-30. Economic ornithology and the correlation of laboratory and field methods, by Clarence Cottam, January 1936, 13 pp., 1 fig.

The particular merits of field and of laboratory studies, and the desirability of combining them; description of analytical methods; illustration of equipment; bibliography of 9 titles.

BS-32. Raising badgers in captivity, January 1936, 2 pp.

Description of the animal, pens, dens, food requirements in captivity; notes on breeding.

BS-33. Forestry and game management, by Herman H. Chapman, Yale School of Forestry, January 1936, 4 pp.

The place of game in the multiple use forest program; necessity of coordinating all interests; foresters must be in charge on forest areas; needs of wildlife; effects of management and lack of it on animal populations; correlation with forestry practice; degree of management economically feasible.

BS-34. Raising raccoons, January 1936, 2 pp.

Selection of ranch site; methods of constructing pens and dens; food requirements in captivity; notes on breeding and management.

BS-35. Raising muskrats, February 1936, 2 pp., bibliography of 6 titles.

Describes areas suitable for rearing the animals; gives reasons why pen raising is not profitable; notes on methods of fencing marsh areas and on breeding and pelts; bibliography of 6 publications relating to muskrat production.

BS-36. Publications on fur and fur animals, January 1936, 2 pp.

Restricted to available official publications of the Biological Survey.

BS-37. The correlation of forestry and wildlife management, by Ira N. Gabrielson, February 1936, 8 pp.

Suggests increased wildlife education in forestry schools; modification of timber cutting, tree planting, and stand improvement practices; adjustment of views of wildlife conservationists; application of existing knowledge pending further research.

BS-38. Cooperative research in wildlife management--a summary of the project to February 15, 1936, by I. T. Bode, February 1936, 16 pp.

Cooperation between States, the Biological Survey, and American Wildlife Institute; table of States and land grant colleges involved; list of project teachers; objectives of the program; tentative plans for each region under the headings of investigational work, trial demonstration and management areas, and educational work.

BS-39. Report on the Arnett, Oklahoma, Experimental Quail and Prairie Chicken Management Project, by Verne Davison; abridged by W. L. McAtee, March 1936, 6 pp.

Explanatory introduction; notes on site; summary of life history findings for the lesser prairie chicken and the bobwhite quail; results of management studies in trapping, planting of feed patches, use of fire, and on water requirements and predators. Comment on introduction of Mexican quail, misconceptions of hunters, and on free hunting.

BS-40. An automatic drinking fountain for minks, by Charles F. Bassett, March 1936, 3 pp., 5 figs.

Home-made device automatically regulating the water supply and preventing its pollution.

GAME RESEARCHES OF IMPERIAL CHEMICAL INDUSTRIES, ENGLAND

Imperial Chemical Industries Ltd., makers of British sporting ammunition, have embarked upon a five-year research into game conservation problems with the principal objective of improving methods of partridge management. A leaflet explaining the nature and objects of the plan may be obtained from the company at Millbank, London, S. W. 1, England. The Foundation has issued 11 Advisory Leaflets briefly abstracted below and a series of supplemental papers on various game topics, any of which desired no doubt also can be obtained upon application. Director, Major H. G. Eley; Collaborators, Captain H. B. Moser, Edgar Page, and A. D. Middleton.

The supplemental papers are: The Hungarian partridge in captivity, The shooter's calendar, The value of shooting rights to the farmer (abstracted on p. 16), Woodpigeons - how to kill them, Grey squirrels - how to kill them,

Trespass notices, and Some suggestions by the Bureau of Animal Populations for the co-operation of private estates in game research. The Advisory Leaflets are:

No. 1 - The treatment and release of imported Hungarian partridges, January 1935, 4 pp.

Description of holding pen and care of birds recovering from the hardships of transportation. Suggestions for amalgamating them with the wild stock.

No. 2 - Partridge coverts, sanctuaries and nesting sites, January 1935, 4 pp.

Selection of site, fencing and planting of small coverts; care and planting of sanctuaries; preservation of natural nesting sites.

No. 3 - Partridges: Winter feeding, grit, dust and drinking trays, January 1935, 4 pp.

Use of winnowings and tailings for winter feed; mixture formula given including olive oil "to help keep the birds warm and make their jackets waterproof"; selecting feeding stations; supplying grit; dusting shelters and items to add when adopted; dew pan drinking trays.

No. 4 - Some notes on the hand-rearing of partridges, January 1935, 8 pp. and a folded plate illustrating "The closing of the wing bars in partridge chicks."

Provision of insect food; suggestions as to foster mothers, management of rearing fields, and supplying staple necessities as dust, grit, water, and food; instructions as to feeding according to age of chicks; description and illustration of plumage changes according to age; merging of broods into the wild stock.

No. 5 - The "Knebworth" system of maintaining a wild partridge stock, January 1935, 4 pp.

A substitute for the Euston system involving mainly the allotment of not more than 12 eggs to a pair of partridges.

by A. D. Middleton.

No. 6 - Periodic fluctuations in British game populations,/Reprint from Journ. Animal Ecol. 3(2), Nov. 1934, pp. 231-249, 13 figs., 6 tables.

Tabulation of the kill for long series of years of rabbits, hares, weasels, partridges, grouse, and woodcock on estates where there was no artificial propagation but as complete suppression of predatory forms as possible. Graphs reveal periodic fluctuation in the population of all of these species. Of interest as indicating lack of effect of "vermin" control on periodicity.

No. 7 - Partridges and artificial manures, January 1935, 4 pp.

Artificial fertilizers do not decrease insect populations, hence presumably are not deleterious to partridges; experiments planned.

No. 8 - The ant egg and its secret, February 1936, 6 pp.

Ant "eggs", really pupae, long considered almost indispensable as a food for partridge chicks were analysed; their value is not in vitamin but in fat content; how to use suet and milk as a substitute; flour moth caterpillars also promising.

No. 9 - How to distinguish sex and age in partridges, February 1936, 7 pp., 5 pls.(half-tone figs.]

Wing coverts of male have a pale longitudinal stripe, of female that stripe and cross bars in addition; first year birds have the outermost primary pointed, adults have it rounded; other tests as flexibility of lower mandible and breastbone.

No. 10 - How to brail a bird, February 1936, 5 pp., 6 diagrams.

Description and illustration of brails and method of applying them. [Brails are wing hobbles to prevent flight.]

No. 11 - The treatment and care of broodies, February 1936, 6 pp.

Selection, general care, disinfection; use of durmy eggs; care of nest boxes; number of eggs per nest; food and feeding-times; not too much time off the nest should be permitted; emergency use of incubator.

SPECIAL ARTICLES

Work of the Division of Forage Crops and Diseases in relation to wildlife management

This Division of the Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C., is interested in legumes and other forage plants from the standpoint of hay or pasturage. It is realized that the seeds of many of these plants as sorghums, lespedezas and others are utilized by game birds and other wildlife, and in some cases the growing crop may make a more or less satisfactory cover.

In the bulletins that have been issued by the Division, emphasis has been laid upon culture and the uses of the plants other than for wildlife. The Division of Forage Crops and Diseases will be very glad, however, at any time, to give advice and information on such matters as culture, source of seed, and similar subjects within its province.

Bulletins now available for free distribution are herewith listed with brief comment on the plants they treat, especially in relation to wildlife.

COWPEA

Cowpeas: Culture and varieties, by W. J. Morse, U.S.D.A. Farmers' Bulletin 1148, 18 pp., illus. 1924.

These are too well known to warrant much mention. They are summer crops and probably seldom leave much in the way of seed for birds except as some seed may fall to the ground. The seeds of most kinds rot quickly on the ground but a few such as the iron cowpea last fairly well into the winter.

CROTALARIA

Crotalaria, a new legume for the south, by Roland McKee and C. R. Enlow, U.S.D.A. Circular 137, 30 pp., illus. 1931.

The species most commonly used for soil improvement on sandy soils in the south produce seed that is not wholesome for wildlife. There are, however, other species which are now coming into use somewhat, which provide excellent forage and of which the seed presumably will be good for game birds. These crops are essentially for sandy lands. Seed generally matures as far north as Wilmington, N. Car., but not much farther.

LESPEDEZA

Lespedeza, by A. J. Pieters, U.S.D.A. Leaflet 100, 8 pp. 1933.
Farm practice with lespedeza, by H. A. Miller, Bureau of Agricultural Economics, U. S. D. A. Farmers' Bulletin 1724, 17 pp., illus. 1934.

There are two classes of lespedezas - annual and perennial. The seeds of all lespedezas are much utilized by quail and other granivorous birds. In good soil the annual lespedezas may make growth high enough to afford cover but upon poor and dry land the growth would hardly be high enough. Lespedeza sericea, on the other hand, which is a perennial, affords ideal cover and the seeds hang on to the plants to some extent almost throughout the winter. When well grown this lespedeza reaches a height of from 18 to 36 inches and the seed may largely be out of reach of ground birds. Some of it, however, falls from time to time and becomes available. Other lespedezas not described in any of our publications are the shrubby forms as L. bicolor and others of that type. Under favorable conditions these form shrubs from four to six or more feet in height. At Experiment, Georgia, the branches, to a large extent, survive the winter and they become three or four years old. At the Arlington Farm near Washington the growth is killed down every winter but new growth comes from the crown. Here quail have been observed to be extremely fond of the seed, which is produced in reasonable abundance. A hedgerow of this lespedeza would form an invaluable source of seed for quail.

PROSO

Proso or hog millet, by John H. Martin, Division of Cereal Crops and Diseases, U.S.D.A. Farmers' Bulletin 1162, 12 pp., illus. 1929.

This as well as the other millets is an annual plant which can be cultivated over most of the eastern part of the United States and will provide excellent seed for game birds.

SORGHUM

Growing and utilizing sorghum for forage, by H. N. Vinall and R. E. Getty, U.S.D.A. Farmers' Bulletin 1158, 32 pp., illus. 1932.

Sorghums are too well known to require much comment. They are hot weather plants and can be sown anywhere in the eastern United States though in some sections of the south it is very difficult to get a crop of grain because of weevil injury and bird depredations.

SOYBEAN

Soybeans: Culture and varieties, by W. J. Morse, U.S.D.A. Farmers' Bulletin 1520, 33 pp., illus. 1927.

Soybeans are grown throughout the United States except in the semi-arid regions. They can be grown in those regions also with a minimum of water, the greatest difficulty connected with their culture being that the crop is very palatable to rabbits and may be destroyed before the farmer can utilize it.

SUDAN GRASS

Sudan grass, by H. N. Vinall, U.S.D.A. Farmers' Bulletin 1126, 21 pp., illus. 1935.

This is an annual that is widely grown in the eastern United States as an emergency hay or grazing crop. Seed is produced mainly in Texas, Oklahoma, and Kansas; as grown in the east the crop is not ordinarily allowed to seed. It could, however, be matured to produce a supply of seed for game birds if desirable.

VETCH

Vetch culture and uses, by Roland McKee and H. A. Schoth, U.S.D.A. Farmers' Bulletin 1740, 22 pp., illus. 1934.

These are common winter cover crops throughout the eastern part of the United States. The plants are seldom allowed to grow long enough to produce seeds; the commercial supply of seed is grown mainly in Oregon but to some extent also in Michigan. In the East the crop is usually turned under while in bloom.

WHEATGRASS

Crested wheatgrass, by H. L. Westover, U.S.D.A. Leaflet 104, 8 pp., illus. 1934.

This is a crop for the north and northwest semi-arid regions where it is one of the very best hay and grazing crops. Seed is produced abundantly when the plant is not grazed too closely and probably makes a desirable food for game birds.

The Williamston feed patch seed mixture

In "Suggestions for Pheasant Management in Southern Michigan" (1933), Professor H. M. Wight recommended, from more than 50 plants tested, a restricted list of those found most satisfactory for feed patch growth. This list filled a great want and has been copied far and wide, probably without due regard to differences in climatic conditions. It would seem desirable in the case of all regions outside of southern Michigan to consult the nearest Agricultural Experiment Station for advice as to the particular strains of the seed producers best to use in each locality, as well as for information about methods of preparing the seedbed, desirability of fertilizing, time of planting, etc.

The plants especially recommended by Professor Wight were: "Sudan grass, early maturing sorghums, various true millets (especially White Wonder and German), proso (the high growing varieties being the best), Siberian millet, various buckwheats (including Japanese, Michigan hybrid, silver hull, and Tartarian), hemp, flax, corrs, cowpeas, and soy beans."

He remarks that, "Although sunflowers provide a good food, they are usually taken by other birds so that in many localities they are of little value for pheasants." During an inspection of the Williamston Project, Professor Wight explained that blackbirds are especially attracted by the sunflowers and that coming in large numbers they not only consume all of the sunflower seed, but also take an undue proportion of the product of other plants in the feed patch.

Experience in the northern plains states indicates that there is nothing better that can be done for pheasants than to leave corn standing in the fields during the winter. In this case also consumption of the grain by other birds is a factor to be taken into consideration. Where crows are abundant, patches of standing corn must be large or the crows may harvest the whole crop.

Since the 1933 report, suggestions for a feed patch seed mixture have been prepared by Professors Wight and English. The 1934 revision is here quoted:

Plant	Percent of mixture by weight
Buckwheat	12.6
Proso, Early Fortune	4.2
Millet, White Wonder	4.5
Millet, Common	4.5
Millet, Tennessee German	4.5
Sorghum, Early Amber	8.4
Sudan Grass	14.0
Sunflower, Mammoth Russian	2.8
Soy Bean, Manchu	4.2
Soy Bean, Ito San	4.2
Cowpeas, New Era	8.4
Flax	8.4
Hemp	8.4
Feterita	3.2
Corn, Golden Glow	7.7
	100.0

Professor Wight recently (March 13, 1936) writes "We found that low seeding rates were more successful on all soils and sites than the higher rates, and my notes indicate best results with a rate not exceeding 20 lbs. per acre. Therefore, I am advising a seeding rate of 15 to 20 lbs. per acre."

"It may seem that the amounts of corn, sorghum, proso, soy beans, and sudan grass are out of proportion to the usual seeding rate advised for the various seeds, but because of the need of covering several of the seeds so lightly, there is necessarily a considerable waste of those seeds that require deeper seeding. For this reason we have advised a heavier proportion of such seeds in the mixture. Incidentally, the surplus seed not covered is an attraction to birds and was used by pheasants, quail, and song birds quite generally in the Williamston food patches."

"I now consider a patch of corn in which soy beans and sunflowers have been planted and which is cultivated and grown until early July and then planted with buckwheat and sudan grass the best food patch."

For the benefit of those who may wish to vary the formula, seeding rates calculated for maximum seed production for the various crops when sown individually are appended. These were furnished by Roland McKee of the Division of Forage Crops and Diseases of the Bureau of Plant Industry. Buckwheat 45 lbs.; corn, 12; cowpeas, 30; flax, 35; hemp, 40; millet, 30; milo, 5; proso, 40; sorghum, 5; soy beans, 20; sudan grass, 25; sunflower, 10.

In the case of milo, sorghum, soy beans, and sunflower the rates are for sowing in rows. For broadcasting in pure stands they might be doubled; in any event to insure heavy seed production, it is better to err on the side of thin as opposed to thick sowing. It may be well also to keep down the representation of tall growing plants so that the effects of shading on the lower, but equally valuable, seed producers will not become too marked.

BIOLOGICAL BIBLIOGRAPHIES

Sporting magazines and conservation department organs

[It will be appreciated if those noting omissions of currently published journals will arrange for sample copies of the publications concerned to be sent to Wildlife Review.]

Of general scope

The American Field. Weekly, $5.00 a year, single copy 15 cents. The American Field Publishing Co., 222 W. Adams St., Chicago, Ill.

American Wildlife. Bi-monthly, $2.00 a year, single copy 25 cents. American Wildlife Institute, Investment Bldg., Washington, D. C.

Field and Stream. Monthly, $2.50 a year, single copy 25 cents. 578 Madison Ave., New York, N. Y.

Fish & Game News of America. Semi-monthly, $2.00 a year, single copy 5 cents. Becket, Mass.

Fur-Fish-Game. Monthly, $1.50 a year, single copy 15 cents. 174 East Long St., Columbus, Ohio.

Game Breeder and Sportsman. Monthly, $2.00 a year, single copy 20 cents. Game Conservation Society, Inc., 205 E. 42nd St., New York, N. Y.

Hunter-Trader-Trapper. Monthly, $2.00 a year, single copy 25 cents. Columbus, Ohio.

Modern Game Breeding and Hunting Club News. Monthly, $2.00 a year, single copy 25 cents. J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa.

National Sportsman. Monthly, $1.00 for 2 years, single copy 10 cents. 404 N. Wesley Ave., Mount Morris, Ill.

Outdoor America. Monthly, $1.00 a year, single copy 10 cents. Izaak Walton League of America, 1167 Merchandise Mart, Chicago, Ill.

Outdoor Life. Monthly, $2.50 a year, single copy 25 cents. Popular Science Publishing Co., Inc., 353 Fourth Ave., New York, N. Y.

Outdoors. Monthly, $1.00 a year, single copy 15 cents. 413 Pleasant St., Beloit, Wis.

Sports Afield. Monthly, $1.00 a year, single copy 15 cents. Mount Morris, Ill.

The Sportsman. Monthly, $4.00 a year, single copy 50 cents, 10 Ferry St., Concord, N. H.

Sportsman's Review. Weekly, $1.00 a year, single copy 5 cents. Sports News Publishing Co., 33 West 42nd St., New York, N. Y.

Sportsmen's Review. Weekly, $4.00 a year, single copy 15 cents. 22 East 12th St., Cincinnati, Ohio. [Devoted almost exclusively to trapshooting.]

Of local scope

Alabama Game and Fish News. Monthly, 50 cents a year, single copy 10 cents. Department of Conservation of Game, Fish, and Seafoods, Montgomery, Ala.

The Alaska Sportsman. Monthly, $1.50 a year, single copy 15 cents. Ketchikan, Alaska.

Hoofs and Horns, including Arizona Wild Life. Bi-monthly, $1.00 a year. 121 E. 10th St., Tucson, Ariz.

California Fish and Game. Quarterly, $1.00 a year; single copy 25 cents. Fish and Game Commission, 450 McAllister St., San Francisco, Calif.

Pacific Sportsman. Monthly, $2.00 a year, single copy 25 cents. 401 Sansome St., San Francisco, Calif.

The Delaware Sportsman. Quarterly, single copy 15 cents. Delaware Game and Fish Protective Association, Wilmington, Del.

Outdoor Florida. Monthly, $1.00 a year, single copy 10 cents. Florida Growers Press, Inc., 1306 Grand Central Ave., Tampa, Fla.

Outdoor Indiana. Monthly, no price quoted. Department of Conservation, State House, Indianapolis, Ind.

Bulletin. Monthly, mimeographed. Game and Fish Commission, Frankfort, Ky.

Louisiana Conservation Review. Quarterly, no price quoted. Department of Conservation, New Orleans, La.

Maryland Conservationist. Quarterly, no price quoted. Game Division of the Conservation Department, 512 Munsey Bldg., Baltimore, Md.

Michigan Conservation. Monthly, 25 cents a year. Department of Conservation, State Office Bldg., Lansing, Mich.

The Northern Sportsman and Resorter. Monthly, $1.00 a year, single copy 10 cents. Guelff Printing Co., Marquette, Mich.

The Minnesota Conservationist. Monthly, $1.00 a year, single copy 15 cents. Department of Conservation, State Office Bldg., St. Paul, Minn.

Western Wild Life. Monthly, $1.00 a year, single copy 10 cents. Billings, Mont.

Outdoor Nebraska. Quarterly, no price quoted. Nebraska State Game, Forestation, and Parks Commission, Lincoln, Neb.

New Mexico. Monthly, $1.00 a year, single copy 15 cents. State Bureau of Publications, 208 W. Gold Ave., Albuquerque, N. Mex.

New York Conservationist. Monthly, $1.00 a year, single copy 10 cents. 367 High St., Lockport, N. Y.

North Dakota Outdoors. Monthly, mimeographed. Game and Fish Department, Bismarck, N. Dak.

The Ohio Outdoor News. Monthly, 50 cents a year, single copy 5 cents. Circleville, Ohio.

Pennsylvania Game News. Monthly, 50 cents a year, single copy 5 cents. Board of Game Commissioners, South Office Bldg., Harrisburg, Pa.

Pennsylvania Outdoors. Monthly, $1.00 a year, single copy 10 cents. The Pocono Press, Cresco, Pa.

The Tennessee Sportsman. Monthly, $1.00 a year, single copy 10 cents. Tennessee Sportsman Publishing Co., Nashville, Tenn.

Great Southwest Skeeter and Sportsman. Monthly, $1.50 a year, single copy 15 cents. 700 Rockwood St., Dallas, Texas.

West Virginia Wild Life. Monthly, $1.00 a year, single copy 15 cents. Newspaper Bldg., Fairmont, W. Va.

NOTES AND NEWS

A national program for wildlife restoration, presented by Ira N. Gabrielson, Chief, Bureau of Biological Survey, U. S. Department of Agriculture, at the American Wildlife Conference, Washington, D. C., February 7, 1936, was summarized briefly in the following paragraphs:

1. Land for the restoration and use of wildlife. The Federal Government has a national responsibility to complete a migratory waterfowl program and where necessary to develop primary areas for the preservation of other wildlife.

2. Closer cooperation between Federal and State agencies. (a) By extending cooperative research and demonstration units now operating in nine States. (b) Federal cooperation with States, even to financial aid, in developing State wildlife management areas that will supplement the primary Federal areas.

3. Recognition of wildlife values. Land management agencies, both public and private, should be brought to recognize the value of wildlife and induced to provide for its needs so far as compatible with other uses.

4. Pollution of waters must be stopped or reduced to a non-destructive point.

5. Research on wildlife problems should be expanded to meet the new problems produced continually by modern developments. The results of this research should be freely available to all land administrators and wildlife management agencies.

6. Closer coordination of the activities of Federal land administrative agencies.

7. Basic protective legislation, and regulations drawn to meet the needs of wildlife, not merely the wishes of groups of special interests.

In a publication recently distributed by The Upper Peninsula Development Bureau, Marquette, Mich., entitled "The Upper Peninsula Forest Experiment Station, What It Is, What It Does," we are informed that "In cooperation with the U. S. Biological Survey, through its forest biologist assigned to the Station, studies are being carried on of the benefits and injuries to the forest caused by the snowshoe rabbit, deer, porcupine, woodchuck, beaver, and birds. Methods are being developed to control the first of these which at times of great abundance may become very destructive to young coniferous plantations."

During the American Wildlife Conference held in Washington, D. C., February 3-7, 1936, a preliminary organization, the Society of Wildlife Specialists, was effected of persons professionally interested in wildlife management. This action was prompted by the conviction that there is need in this rapidly growing profession for an agency to define and maintain standards for the work and workers, to affiliate for the common good all subscribing to those standards, and to consider the feasibility of establishing a periodical devoted to wildlife management.

Officers of the preliminary organization, elected at a meeting of more than a hundred persons, are: President, Ralph T. King of the Minnesota Agricultural Experiment Station; First Vice-President, Ernest G. Holt of the U. S. Soil Conservation Service; Second Vice-President, Miles D. Pirnie of the Michigan State College of Agriculture, and Secretary-Treasurer, W. L. McAtee of the U.S. Biological Survey.

Aldo Leopold of the University of Wisconsin and Herbert L. Stoddard of the Cooperative Quail Study Association of Thomasville, Ga., are Counsellors to the President. A regional Advisory Board also has been appointed by the President, consisting of N. W. Hosley, Harvard Forest, Petersham, Mass.; Gardiner Bump, State Conservation Department, Albany, N. Y.; Ross O. Stevens, U. S. Soil Conservation Service, Spartanburg, S. Car.; E. A. Schilling, U.S. Forest Service, Atlanta, Ga.; Rudolf Bennitt, University of Missouri, Columbia; T. H. Langlois, Bureau of Fish Propagation, Columbus, Ohio; Harry Adams, U.S.

Forest Service, Milwaukee, Wis.; W. P. Taylor, U. S. Biological Survey, College Station, Texas; Paul L. Errington, Iowa State College, Ames; J. Stokley Ligon, Carlsbad, N. Mex.; Arthur S. Einarsen, U. S. Biological Survey, Corvallis, Oreg.; Joseph Dixon, National Park Service, Berkeley, Calif.; George L. Girard, University of Wyoming, Laramie.

Col. Lewis S. Thompson died on his plantation - Sunny Hill - in southern Georgia on March 25, 1936. Col. Thompson was the principal organizer and moving spirit of the committee of sponsors for the Cooperative Quail Investigation carried on from 1924 to 1929, the results of which were published in two preliminary reports and in a final publication in book form "The Bobwhite Quail, its habits, preservation and increase," by Herbert L. Stoddard and collaborators. Col. Thompson again was chiefly instrumental in organizing the Cooperative Quail Study Association in 1931 to continue certain lines of inquiry started in the original investigation, and in securing the return of Mr. Stoddard to be its Director. He was a man of broad human understanding and full of good deeds modestly done.

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